



SDSU/Claremont Graduate School Joint Doctoral Program

ED827

Cognition & Communication
Teaching and the Human Brain*

*syllabus also available on **Blackboard**

Dr. Carla Mathison
 E-Mail: cmathiso@mail.sdsu.edu

Office: NE-95
 PHONE: 619-594-5963

Course Description

Overview

During the past several decades, psychologists, educators, neurologists, biologists and a host of professionals from other related fields have come together to focus on the human brain and its capacity to learn. Through this combined or 'interconnected' effort, we are beginning to discover physiological and psychological characteristics of our brains that stimulate new ways of thinking about cognition and communication. We are moving more purposefully toward a perception of teaching and instructional development as, "... *the applied science of the brain.*" (Zull, p. 4)

In this course, we will take a careful and thoughtful look at recent research on the human brain and its implications for learning and instruction. We will discuss issues involving perception, attention, consciousness, memory, and emotion. We will then turn our attention to responsive teaching methods focusing, in particular, on situated cognition, brain-based learning principles and authentic learning principles.

During our time together this semester, we will generate more questions than answers, feel more ambiguity than clarity, and have moments of discomfort and resistance that accompany any meaningful shift in perspective. As an educator, the openness and energy you bring to the issues raised in this class will influence both your professional and your personal life. I look forward to our adventure together!

Learning Outcomes

As we move through the course, you will have the opportunity to work both individually and as part of a small team to;

- 1) ... *digest relevant findings in cognitive neuroscience and their potential implications for education research, policy & practice;*
- 2) ... *examine the ways in which your own brain goes about the process of learning;*
- 3) ... *reexamine & articulate your philosophical orientation toward the teaching/learning dynamic;*
- 4) ... *develop a model of educational practice that reflects an understanding of educational neuroscience, and;*
- 5) ... *operationalize that model within the context of your own learner population.*

Course Design

ED827 is designed as a hybrid course in which approximately 8-10 sessions will be face-to-face with the instructor. Sessions that are not face-to-face will involve working either individually or with a small team of classmates on specific projects using instructor-provided internet sites and CD's. In addition to this time, you will need to allocate 2-3 hours each week for individual or team work related to course projects (especially during the second half of the course). When working on team projects, much of your communication with team members may be electronic but there may also be times when you meet together directly.

Course Materials

For each class session, your instructor has selected materials for you to explore and study. These materials may be accessed online through **Blackboard**. You will be able to download and print most documents if you wish. The URL's for these materials are found in the Class Schedule (below) under the particular session to which they pertain.

NOTE: All of Dr. Mathison's PowerPoint lectures can be viewed/downloaded from Blackboard.

Class Schedule

In-class instruction
 Activities/Projects
 Project DUE dates
 Readings
 Information Explorations

1/23/08

Session #1 – **Course Overview**

1/30/08

Session #2 – **What's in this Brain of Ours? Brain Anatomy**

- **Anatomy of the Human Brain** – Mathison Powerpoint (see **BB-Course PP Lectures**)
- *Secret Life of the Brain* <http://www.pbs.org/wnet/brain/3d/index.html>
- *Scanning the Brain* <http://www.pbs.org/wnet/brain/scanning/index.html>
- Activity: Building a Human Brain
- Reading: *Neuroscience and Education: A Review of the contributions of brain science to teaching and learning* by J. Hall (2005) – pages i-8 (see **BB – Course Readings**)

Sites to Explore during the Week:

Brain Anatomy–Digging Deeper <http://www.psych.ualberta.ca/~ITL/brain/>
Brain from Top to Bottom http://thebrain.mcgill.ca/flash/index_i.html

2/6/08

Session #3 **The Neuron & Neurotransmitters**

- **Neurotransmitters** – Mathison Powerpoint (see **BB-Course PP Lectures**)
- *Neurons & How They Work* <http://www.youtube.com/watch?v=ysDGX6bOgAw&mode=related&search=>
- *The Synapse* <http://www.youtube.com/watch?v=YwN9aCobCy8>
- *The Brain* - video
- Activity: Building a Neuron

Sites to Explore during the Week:

Mirror Neurons http://www.youtube.com/watch?v=_8WV1zAh9zU
Miracle of the Human Brain
<http://www.youtube.com/watch?v=FZ3401XVYww&NR=1>
Physiological Events at the Neuronal Synapse
http://www.wisc-online.com/objects/index_tj.asp?objID=AP1201

2/13/08Session #4 **Perception: Seeing is Believing --- Believing is Seeing**Perception – Mathison Powerpoint (see **BB-Course PP Lectures**)*Mind Illusions* <http://www.pbs.org/wnet/brain/illusions/index.html>

- Reading: *Neuroscience and Education: A Review of the contributions of brain science to teaching and learning* by J. Hall (2005) – pages 9-24 (see **BB – Course Readings**)

2/20/08Session #5 **Attention & Consciousness****DUE:** Senses Project (20 points possible) (see **BB – Senses Project Description**)

- Attention/Consciousness – Mathison Powerpoint (see **BB-Course PP Lectures**)
- Sharing Senses Projects

Sites to Explore during the Week:

Coming to Attention <http://www.sciam.com/article.cfm?articleID=00001590-CDCC-14C7-8DCC83414B7F0000>*Multi-Tasking* <http://www.npr.org/templates/story/story.php?storyId=7700581>**2/27/08**Session #6 **"Memories Light the Corners of My Mind"**

- Memory – Mathison Powerpoint (see **BB-Course PP Lectures**)

- Video – Human Memory

- Reading: *The Neuroscience of Joyful Education*, by J. Willis (2007) (see **BB – Course Readings**)

Sites to Explore during the Week:

H. M. 's Brain and the History of Memory <http://www.npr.org/templates/story/story.php?storyId=7584970>*Exploring the Relationship between Music and Memory*<http://www.npr.org/templates/story/story.php?storyId=5075918>**3/5/08**Session #7 **Armaiti Island Quest**

- Introduction/Overview of *Armaiti Island Quest* (CD will be provided)
- Phase I Description

- Readings:

The Pedagogy of Poverty Versus Good Teaching by Martin Haberman*Everyone Wants to Rule the World* by Arnie Cooper (see **BB – Course Readings**)*The Components of Authentic Learning* by A. Rule (2006) (see **BB – Course Readings**)

3/12/08Session #8 **Principles of Brain-Based Learning**

- Readings: *Armaiti Island Phase 1 Readings* (see **Armaiti Island CD**)
Toward a Redefinition of Formal and Informal Learning: Education and the Aboriginal People by George E. Burns (see **BB – Course Readings**)

Brain-Based Learning – Mathison Powerpoint (see **BB-Course PP Lectures**)**3/19/08**

Session #9 **NO FORMAL CLASS SESSION** (NOTE: In addition to time during the normally scheduled class hours, you will need to schedule at least 2-3 hours this week for team work on this project.)

Armaiti Island Small Group PHASE 1 project work time (see **Armaiti Island CD**)**3/26/08**Session #10 **The Art of Questioning**The Art of Questioning – Mathison Powerpoint (see **BB-Course PP Lectures**)**DUE: Armaiti Island *Philosophy of Education Statement*** (20 points possible)**4/2/08 – Spring Break****4/9/08**

Session #11 **NO FORMAL CLASS SESSION** (NOTE: In addition to time during the normally scheduled class hours, you will need to schedule at least 2-3 hours this week for team work on this project.)

Armaiti Island Small Group Project PHASE 2 project work time (see **Armaiti Island CD**)**4/16/08**

Session #12 **NO FORMAL CLASS SESSION** (NOTE: In addition to time during the normally scheduled class hours, you will need to schedule at least 2-3 hours this week for team work on this project.)

Armaiti Island Small Group Project PHASE 2 project work time (see **Armaiti Island CD**)**4/23/08**Session #13 **Armaiti Island Vision of Education****DUE: Armaiti Island *Vision of Education*** (30 points possible)**• VISION OF ARMAITI ISLAND EDUCATION PRESENTATIONS**

4/30/08
 Session #14 **NO FORMAL CLASS SESSION**
Armaiti Island Individual Project PHASE 3 work time (see **Armaiti Island CD**)

5/7/08
 Session #15 **Armaiti Island Instructional Units**
DUE: Armaiti Island Instructional Unit (20 points possible)
• INSTRUCTIONAL UNIT DESCRIPTION PRESENTATIONS

Assignments

Point Values

Senses Project	20
Armaiti Island Philosophy of Education (Phase 1)	20
Armaiti Island Vision of Education (Phase 2)	30
Armaiti Island Instructional Unit (Phase 3)	20
Active Participation in Class Discussion*	10
TOTAL	100

NOTE: If, for any reason, you anticipate being absent or late to a class, please contact me *prior* to that class period either by phone or e-mail. Also, please pay special attention to the DUE DATES of assignments. **TEN PERCENT** of the total possible points will be subtracted from your assignment grade *each day* after the DUE DATE.

* Professionalism is defined and evaluated using the following criteria:
 - attendance -attitude - initiative -participation in face-to-face and online discussion
 - preparedness/timeliness -responsibility -quality of writing -collaboration/collegiality

Final Grading Scale

93-100 = A	80-82 = B-
90-92 = A-	77-79 = C+
87-89 = B+	73-76 = C
83-86 = B	etc.

NOTES: